Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Claim 1 (currently amended): An apparatus for charging a battery of a portable electronic device that includes a main controller controlling overall operation of the portable electronic device, the portable electronic device being connected to a computer USB port, the apparatus transferring power from the computer through the USB port, the apparatus comprising:

a charger control portion electrically connected with the main controller, the charger control portion generating charge control signals at one or more outputs according to a battery selection signal that is output from the main controller and received at an input of the charger control portion, the battery selection signal distinguishing the battery from a plurality of batteries installable in the portable electronic device;

a charging portion electrically connected with the charger control portion and receiving charge control signals from the one or more outputs of the charger control portion; and

a transistor externally connected to the charging portion, the transistor and the charging portion cooperating to charge the battery according to the charge control signals generated by the charger control portion.

Claim 2 (original): The apparatus of claim 1, wherein the charge control signals of the control portion comprise a charge start signal to enable output of the charging portion.

Claim 3 (original): The apparatus of claim 1, wherein the charge control signals of the control portion comprise a battery type signal to control an output voltage level according to the battery selection signal.

Claim 4 (original): The apparatus of claim 1, wherein the charge control signals of the control portion comprise a charge voltage control signal and a charge current control signal,

which are generated based on the detection of a charge current and a charge voltage from the charging portion, to control the charge current and the charge voltage.

Claim 5 (previously presented): The apparatus of claim 1, further comprising a USB controller for controlling bidirectional data transmission between the computer and the portable electronic device.

Claim 6 (original): The apparatus of claim 1, wherein the battery selection signal is input by a user.

Claim 7 (original) The apparatus of claim 1, wherein the battery selection signal is input by a battery recognition apparatus.

Claim 8 (previously presented): A digital camera connected to a computer by USB to charge a battery by receiving power from the computer through USB, the digital camera comprising:

a battery recognition apparatus that distinguishes the battery from a plurality of batteries installable in the digital camera;

a digital camera controller in communication with the battery recognition apparatus, the digital camera controller generating a battery selection signal that identifies the battery;

a USB charger including a USB controller to transmit and receive data through a USB port of the computer, a control portion to generate charge control signals corresponding to the battery selection signal, a charging portion electrically connected with the control portion, and a transistor externally connected to the charging portion, the transistor and the charging portion cooperating to charge the battery according to the charge control signals from the control portion; and

a power converting portion to receive power from the battery that is charged by the charger and generate and output power having a plurality of voltage levels.

Claim 9 (original): The digital camera of claim 8, wherein the charge control signals of the control portion comprise a charge start signal to enable output of the charging portion.

Claim 10 (original): The digital camera of claim 8, wherein the charge control signals of the control portion comprise a battery type signal to control an output voltage level according to the battery selection signal.

Claim 11 (original): The digital camera of claim 8, wherein the charge control signals of the control portion comprise a charge voltage control signal and a charge current control signal which are generated by receiving a charge current and a charge voltage from the charging portion to control the charge current and the charge voltage.

Claim 12 (previously presented): A USB cable for transferring power from a USB receptacle to a portable electronic device with a power and data port, a battery and a device controller, the USB cable comprising:

a first connector configured to mate with the USB receptacle;

a second connector configured to mate with the power and data port;

at least two wires electrically connecting the first and second connectors; and

a USB battery charger enclosed within the second connector, the USB battery charger including a charging portion that communicates with the device controller for receiving at least one signal relative to the battery, the charging portion adjusting power received from the USB receptacle relative to the at least one signal for charging the battery.

Claim 13 (previously presented): The USB cable of claim 12 wherein the USB battery charger further comprises a control portion in communication with the charging portion, the control portion receiving the at least one signal from the device controller and outputting at least one charge control signal relative to the at least one signal.

Claim 14 (previously presented): The USB cable of claim 13 wherein the control portion comprises a PWM module for outputting at least one of a voltage control signal and a current control signal.

Claim 15 (previously presented): The USB cable of claim 13 wherein the control portion comprises the device controller.

Claim 16 (previously presented): The USB cable of claim 13 wherein the USB battery charger further comprises a USB controller for controlling bidirectional data transmission between the USB port and the device controller.

Claim 17 (previously presented): The USB cable of claim 12 wherein the USB battery charger further comprises a USB controller for controlling bidirectional data transmission between the USB receptacle and the device controller.

Claim 18 (previously presented): The USB cable of claim 17 wherein the at least two wires comprises:

a first portion that interconnects a data interface of the first connector with the USB controller; and

a second portion that interconnects a power interface of the first connector with the charging portion.

Claim 19 (previously presented): The USB cable of claim 18 wherein the first portion comprises a twisted-pair cable.

Claim 20 (previously presented): The USB cable of claim 13 wherein the charging portion comprises:

a linear regulator for outputting power to the control portion;

a reference voltage generating portion for adjusting a voltage charging the battery; and

a voltage/current regulator including an attenuator, a current sense amplifier, a voltage regulation loop compensator and a current regulation loop compensator.